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NOTES AND DESCRIPTIONS OF EXOTIC BIBIONIDAE¹

(DIPTERA)

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The following descriptions of a new genus, several new species, descriptive notes on poorly known species and nomenclatorial changes have been accumulated over a period of several years and are based upon collections received from the following sources: The United States National Museum; The California Academy of Sciences; The American Museum of Natural History, The Deutsches Entomologisches Institut, Berlin; and from Dr. R. Dreisbach, Midland, Michigan. I greatly appreciate having had the opportunity of studying these interesting collections. Most of the drawings have been prepared by Mrs. Phyllis Habeck, University of Hawaii. I am very grateful for this help.

Enicoscolus, new genus

This most remarkable bibionid is related to *Bibio* Geoffroy but differs very strikingly in the following details: The thorax is elongate, about two times longer than wide and the pronotum and anterior portion of the mesonotum are rugose and covered with spinose setae (fig. 2d). The antennae are short, clavate with only five clearly visible segments in the flagellum. The front tibia is very short and is developed into a large apical spur; the inner spur is rudimentary, represented by just a short bristle-like process (fig. 2b). The m cross-vein is lacking in the wings and the costa and radial sector end at about the apical one-third to one-fourth of the wing (fig. 2e). Also the radial sector is characteristically thickened at the apex.

The genus name is derived from the Greek *enikos*, singular or unique, and *skolos*, anything pointed, thorn. The name is masculine.

The genus contains the following two new species. At present only the females are known.

Type of the genus: *Enicoscolus dolichocephalus*, n. sp.

¹ Published with the approval of the Director of the Hawaii Agricultural Experiment Station as Technical Paper No. 466.

KEY TO KNOWN SPECIES OF ENICOSCOLUS BASED UPON FEMALES

1. Head elongate, two times longer than wide, rostrum produced, sclerotized portion of head in front of eyes two-thirds as long as the eye and nearly equal to the portion of the head behind the eyes (fig. 2a.)
 Thorax all rufous *dolichocephalus*, n. sp.
- Head short, not much longer than wide. Rostrum not produced, sclerotized portion in front of eyes not extending beyond bases of antennae and scarcely as long as one antennal segment (fig. 1). The dorsum of the thorax is shining black *brachycephalus*, n. sp.

***Enicoscolus brachycephalus*, n. sp. (Fig. 1)**

This species is readily differentiated from *E. dolichocephalus*, n. sp. by the characters given in the above key.

Female.—Fitting the characteristics given for *dolichocephalus* in most respects, differing in the head characters, in the all-black dorsum of the thorax, and brownish colored pleura; also the wings are more brownish fumose and the posterior veins are darker colored. *Head*: Short, scarcely longer than wide, the rostrum not at all developed, the sclerotized portion beyond the eye margin is scarcely equal in length to one antennal segment. The last segment of each palpus is long and slender, four or five times longer than wide (fig. 1). The front between the eyes is about two-thirds as wide as one eye. The portion of the head behind the eyes is about two-fifths as long as one eye. The front is rather thickly covered with erect black setae. *Thorax*: Entirely polished black on the dorsum including the scutellum and metanotum. The propleura are yellow, tinged lightly with brown. The remainder of the pleura are predominantly yellow-brown, dark brown along the upper edges of the mesopleura, pteropleura, and over the entire metapleura and hypopleura. *Legs*: Similar to those of *dolichocephalus* except that the hind coxae are dark brown to black. The front tibia is very similar to that of *dolichocephalus* as in figure 2b. *Wings*: Very similar to those of *dolichocephalus* but more distinctly brownish fumose with pale brown posterior veins. *Abdomen*: Dark velvety brown, predominantly black haired but with yellow pile on the cerci and the genital portion of the abdomen.

Length: Body, 4.2 mm.; wings, 5.4 mm.

Male unknown.

Holotype female, Yautepec, Morelos, Mexico, Oct. 29, 1956 (R. and K. Dreisbach). One paratype female, Tepotzlan, Morelos, Mexico, Sept. 26, 1957 (R. and K. Dreisbach).

Type in the United States National Museum. The paratype is in the collection at the University of Hawaii.

***Enicoscolus dolichocephalus*, n. sp. (Figs. 2a-e)**

This species differs from the only other known species of the genus by the characters given in the above key.

Female.—*Head*: Polished black, tinged with red beyond the eyes; the mouth parts are yellow, tinged with brown or black. The antennae and palpi are dark brown to black. From a front view the head is 2.3 times longer than wide. The

rostrum (the sclerotized portion of the front beyond the eyes) is rather strongly developed, equal in length to about two-thirds the length of the eye and almost as long as the portion of the head behind the eye (fig. 2a). The front between the eyes is almost as wide as one eye, as seen from direct dorsal view. The ocelli are moderately large but are not raised on a prominence. The antennae are seven segmented, shaped as in figure 2a, the last two segments are closely joined. The palpi are five segmented, the apical segment is about 1.5 times longer

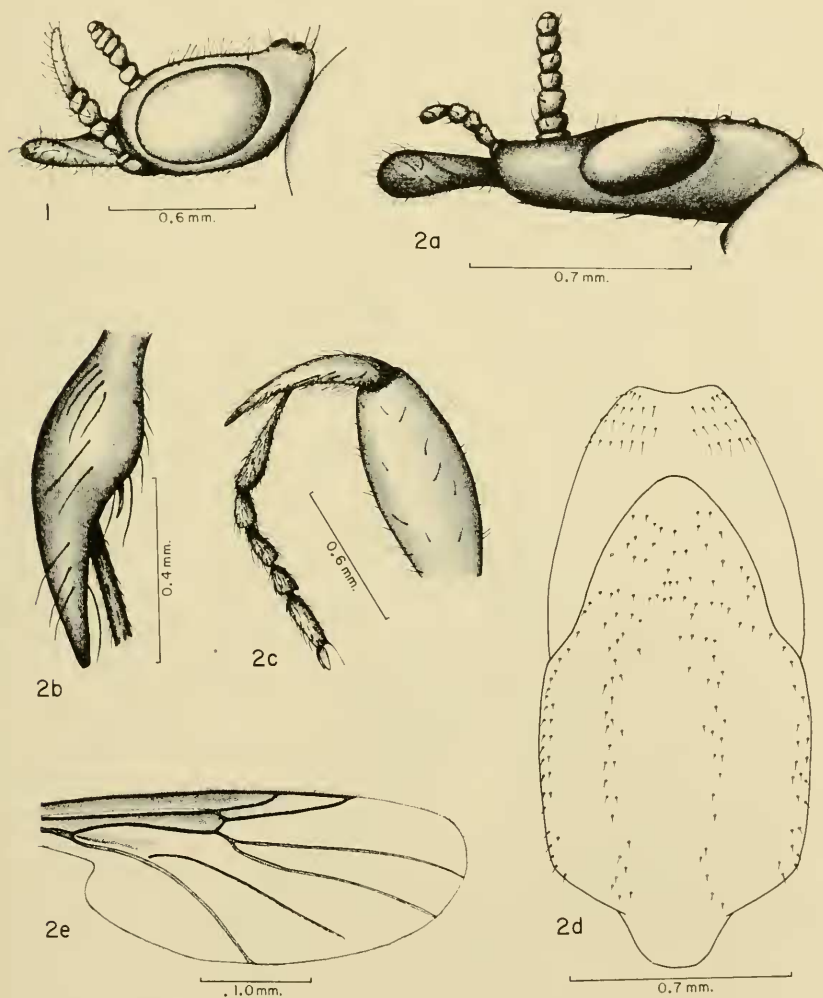


Fig. 1, *Enicoscolus brachycephalus* n. sp., head, lateral view. Fig. 2, *E. dolichocephalus* n. sp. a. head, lateral view; b. front tibia; c. front leg, lateral; d. thorax, dorsal view; e. wing.

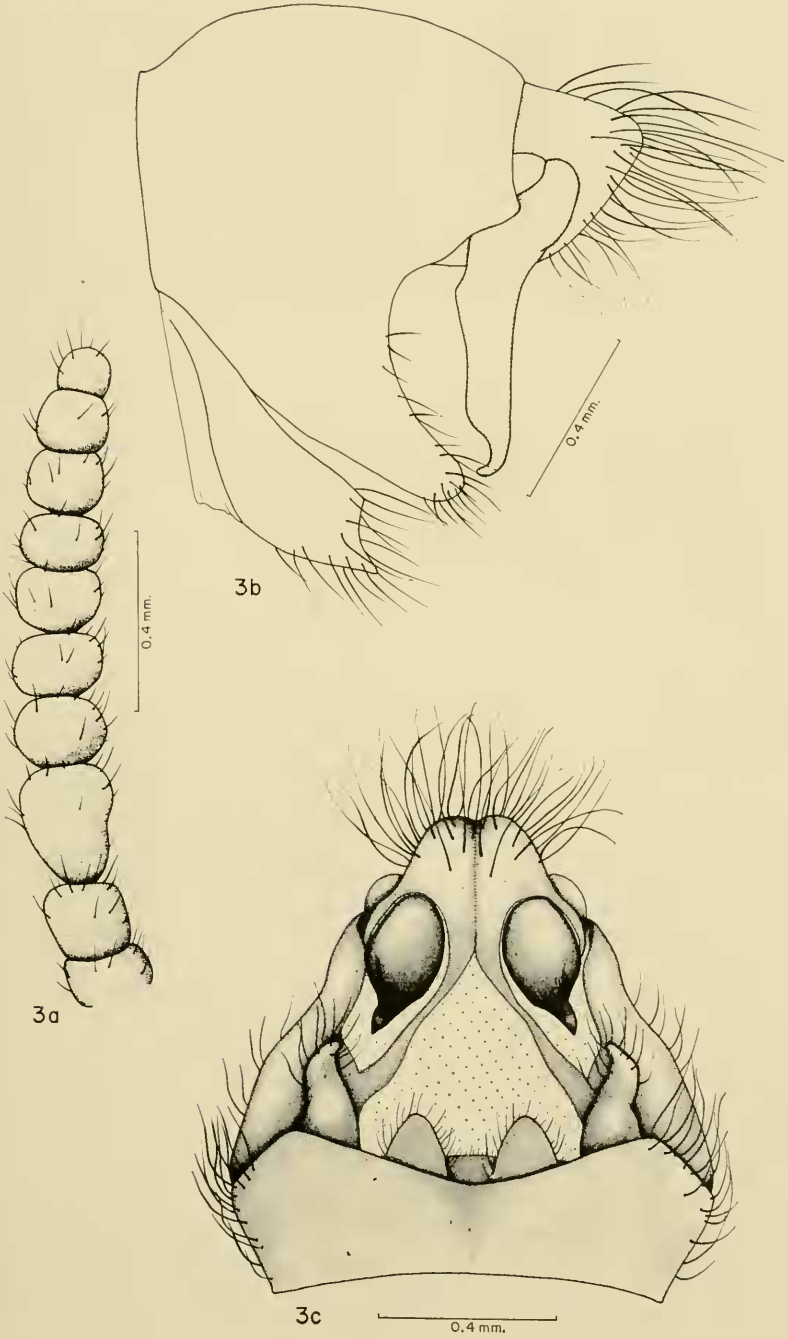
than wide. The penultimate and antipenultimate segments are about as wide as long, the latter has a depressed sensory area on the dorsal surface; the two basal segments are very short and inconspicuous. The head is bare except for about a dozen erect pale setae on the anterior median portion of the front, for a series of short, erect setae extending down the median portion of the under surface, and for a few short hairs immediately behind the ocellar triangle. Mouth parts slightly longer than the rostrum, the labella are fleshy and rather densely setose. *Thorax*: Predominantly red, except for the black pronotum. The vestiture is entirely yellow. The pronotum and the anterior portion of the mesonotum are rather thickly covered with spinose setae, these also extend down each dorsocentral row and along each side of the mesonotum; the areas between these rows are bare. The pleura are devoid of setae. The bases of the halteres are yellow; the knobs are dark brown to black. *Legs*: Front coxae elongate, almost equal in length to the femora. Front femora very short and thick, about two times longer than wide. Front tibia short, the large spur occupying most of the segment. The inner spur is very tiny, it is one-third to one-half as long as the yellow hairs around the edge of the tibia (fig. 2b). The basitarsus is slender, slightly curved, about three-fourths to four-fifths as long as the tibia (fig. 2c). The coxae and trochanters are entirely rufous, the front and middle femora are rufous with a slight tinge of brown on the upper apical portions; the hind femora are predominantly shining black, yellow to rufous on the attenuated basal portion. The front tibiae are rufous except for the brown to black bases. The remainder of the legs is entirely black. The middle tibiae have conspicuous spinose setae rather densely placed over the dorsal surface. The apical spurs of the middle and hind legs are blunt at apices. *Wings*: Lightly fumose, the anterior veins are dark brown, the posterior veins are faintly brownish yellow, just slightly darker than the wing membrane. No distinct stigma is present, but cell R1 and the costal cell are brown fumose. Vein R1 ends at about the apical two-fifths of the wing and the radial sector and the costa end near the apical fourth of the wing (fig. 2e). The basal section of the radial sector is one-half to one-third as long as the r-m crossvein. Vein M1+2 beyond the r-m crossvein is slightly shorter than the crossvein. There is no indication of a m crossvein and vein M3+4 ends well before the wing margin. *Abdomen*: Brown, with mixed yellow and brown pile. The conjunctiva is yellow-brown.

Length: Body, 4.5–5 mm.; wings, 4.5 mm.

Male unknown.

Holotype female Tepotzlan, Morelos, Mexico, Oct. 20, 1957 (R. and K. Dreisbach). Two paratype females from Cuernavaca, Morelos, Mexico, Oct. 20-29, 1957 (R. and K. Dreisbach).

Type in the United States National Museum. One paratype has been returned to Dr. R. R. Dreisbach and one is in the University of Hawaii collection.



Plecia impensa Hardy (Figs. 3a-c)

Plecia impensa Hardy, 1957, Ann. des Naturh. Mus. Wien 61:238, figs. 1-2.

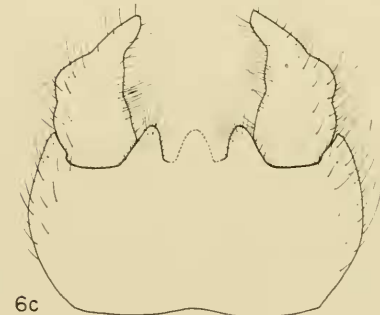
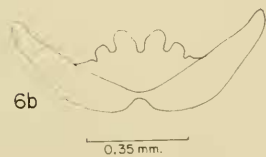
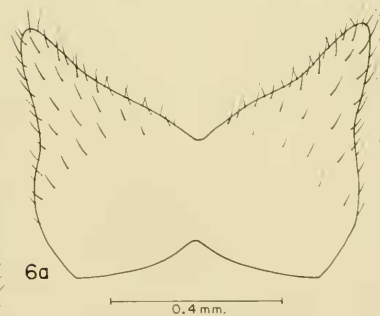
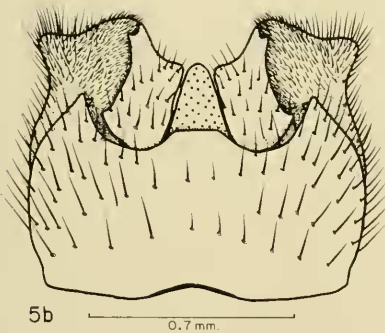
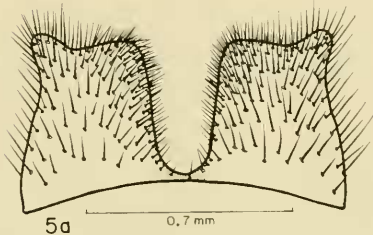
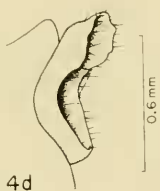
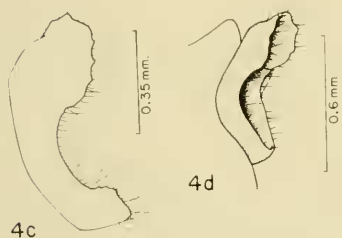
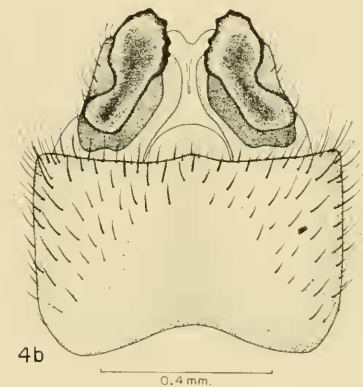
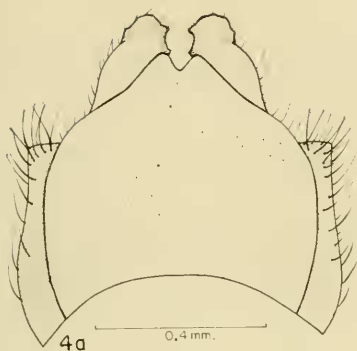
The species has previously been known only from the holotype male from Bilimek, Mexico, taken in 1883. The type is in the Naturhistorisches Museum, Wien. Five specimens have been studied in the California Academy of Sciences collection from Real de Arriba, Temescaltepec, Mexico, May 24, 1933 (H. E. Hinton and R. L. Usinger) and some descriptive details should be added to the original description. This species belongs to the group which has the thorax opaque black, but it will not fit anything beyond couplet 13 in my key to the new world *Plecia* (Hardy, 1945:392). As pointed out in the original, the species appears to be related to *P. nigra* Philippi from Chile. The statement saying that it is differentiated "by the absence of a median projection on hind margin of ninth sternum" is incorrect; this should have read ninth tergum.

The antennae were broken off the type; they are distinctly ten segmented (fig. 3a). The palpi are moderately long and slender, when fully extended they measure slightly longer than the antennae and about the same as the head length (approximately 2 mm.); the segments are approximately equal in length, each is about three times longer than wide. The thorax is entirely opaque black, except for a faint rufous tinge in the middle of the scutellum, behind and under the wing bases, along the upper edge of each mesopleuron and through the upper portion of each pteropleuron. The mesonotum is lightly, but distinctly, gray pollinose. A pair of distinct submedian (down each dorsocentral line) furrows extend down the mesonotum and an indistinct median furrow is also present. The prescutellar depression is well developed and the area is coarsely rugose. In the additional specimens at hand the wings are intensely tinged with yellow, narrowly brown only on the anterior margin from the tip of vein R1 to the wing apex. The stigma is brown, darker than the surrounding membrane in these specimens. In the type the wings are dark brown fumose along the costal margin and at the base. The male genitalia are characterized by having the ninth sternum rather strongly produced on the posterior median margin, extending well beyond the bases of the claspers; this produced median portion is very densely pilose (fig. 3c). The anterior lateral margins of the sternum are also strongly produced around the genital chamber (fig. 3b). The claspers are long, slender, and sharp pointed; in normal position they are folded down over the top portion of the genital chamber. In normal position the ninth tergum is directed ventrally, parallel with the lateral lobes of the ninth sternum (fig. 3c).

The body and wings of the specimens at hand measure 12 to 13.5 mm.

The female has not previously been described. It fits the description of the male in all details except for sexual characteristics. The antennae are eleven segmented. The front is slightly narrower than the width of one eye and has a

Fig. 4. *P. paracollaris* n. sp. a. male genitalia, ventral; b. male genitalia, dorsal; c. male clasper, outside lateral view; d. male clasper, inner end view. Fig. 5. *P. peruviana* n. sp. a. ninth tergum of male; b. male genitalia, ventral. Fig. 6. *P. quasimaculata* n. sp. a. ninth tergum of male; b. posteromedian margin of ninth tergum, end view; c. male genitalia, ventral.



distinct carina down the median portion. The ocellar triangle is very prominent. The portion of the head behind the eyes is about one-half the length of one eye. The humeral ridges and the sides of the mesonotum are rufous, tinged with brown.

Length: Body, 13 mm; wings, 15 mm.

Plecia mallochi Hardy

This is the correct name for *Penthtria thoracica* Guérin-Ménéville, 1838, in Duperrey, Voy. autour du Monde sur la Corvette de la Coquille 2:507. Preoccupied by *Laphria thoracica* Fabricius, 1805, System. Antl., 163, which is a synonym of *Plecia collaris* (Fabricius). I was in error in proposing the name *P. dispersa* for this species since the name *mallochi* (Hardy 1948) is available. Refer to Hardy 1958: 196. *Plecia dispersa* Hardy should be treated as an invalid name.

Plecia paracollaris, n. sp. (Figs. 4a-d)

This species fits very close to *P. collaris* Fabricius and runs to this in my key to the new world *Plecia* (Hardy 1945:393). The brown to black spot on the anterior portion of the mesonotum is smaller and less distinct in *paracollaris* and the male genitalia are distinctive: the median process of the ninth sternum has a much shallower U-shaped cleft on the hind margin (fig. 4a); the ninth sternum has a moderately strong, sharp-pointed lobe on each lateral margin; the claspers are not so distinctly bilobed; and the posterior median margin of the tergum has a dorsally produced process. For a comparison compare the figures of *collaris* (Hardy 1945:526, figs. 135e-e).

Male.—*Head*: Antennae entirely black, rather short, the flagellum is made up of seven closely placed segments. The mouth parts are entirely black, except for a tinge of rufous on the labella; they are approximately equal in length to the head and are folded beneath the head when not in use. Ocellar triangle, prominent, *Thorax*: Predominantly shining, yellow to rufous above and black on the sides and venter. The margins of the mesonotum, and the depressed area in front of the scutellum are yellow-gray pubescent. The dark brown to black spot is confined to the anterior median portion of the mesonotum. The scutellum is yellow, except for a narrow streak of brown extending vertically across the apex. The metanotum is yellow to rufous, tinged lightly with brown. The pleura are black, except for a tinge of rufous below the wing bases. The halteres are black. *Legs*: Entirely black, rather thickly black pilose. The hind basitarsi are four times longer than wide. *Wings*: Pale, infuscated with yellow-brown, darker along the anterior margin; the stigma is just slightly darker than the surrounding membrane. Vein R2+3 is about half as long as the basal portion of Rs; it extends vertically for a short distance, then curves gradually and enters the costa at an angle of about 55° with vein R4+5. *Abdomen*: Entirely black, black pilose and rather densely brown pollinose. From a direct ventral view the ninth sternum is about as long as wide, the posterior median portion is slightly produced and has a shallow U-shaped concavity at the apex (fig. 4a). The sternum has a sharp, spine-like projection developed from each upper lateral margin. The claspers are large and conspicuous, as seen from lateral view they

are bilobate (fig. 4c); the apical lobe is blunt and has two or three teeth-like serrations on the inner surface. From inner end view the claspers are hollowed out, concave apically (fig. 4d). The ninth tergum is nearly two times wider than long, the posterior margin is straight or nearly so (fig. 4b); a longitudinal groove extends the entire length down the middle of the segment, and the posterior median portion is produced into a large blunt lobe which extends into the genital chamber.

Length: Body, 4.7 mm.; wings, 5.5 mm.

Female.—Fitting the description of the male in most respects, the brown marking on the anterior portion of the mesonotum is, however, less distinct; the pleura are brown, tinged with rufous, and vein R2+3 is oblique in position and about three-fourths as long as the basal portion of the Rs.

Length: Body, 6 mm.; wings, 7.3 mm.

Holotype male, allotype female (in copula) and two male paratypes from Buenaventura, Columbia, Nov. 2, 1950 (Michelbacher and Ross).

Type and allotype returned to the California Academy of Sciences. One paratype deposited in the United States National Museum and one in the University of Hawaii collection.

Plecia peruviana, n. sp.

(Figs. 5a-b)

This species belongs in the *confusa* group but appears more closely related to *P. amplipennis* Skuse (from the Pacific) than to any known South American species. It is allied to *confusa* Loew because of the all rufous thorax, short mouth parts and deeply cleft ninth tergum of the male but the genital characters are very different. It runs out with *confusa* in couplet 40 of the writer's key to the new world *Plecia* (1945:394) but is readily differentiated by having the ninth tergum of the male not developed into clasper-like lobes and by the large, strongly developed claspers (fig. 5b).

Male.—The antennae are ten segmented and chiefly black in color, the apices of the two basal segments are yellowish. The ocellar tubercle is moderately developed but not so large as in most species. The rostrum is slightly over half as long as the antennae. *Thorax*: Entirely opaque orange, the mesonotal furrows are moderately developed. The stems of the halteres are yellowish, the knobs are brown to black. *Legs*: All black, thickly covered with black pile. Femora slightly enlarged on the apical halves. The tibiae are slender, with parallel sides. *Wings*: Predominantly light brown fumose, dark brown along the anterior margin. Stigma faint, not clearly differentiated from the wing membrane. Vein R2+3 nearly straight and forming an 80°—85° angle with R4+5. Petiole of cell M1 less than 1.5 times longer than the r-m crossvein. The cubital cell is not narrowed at the apex. *Abdomen*: All black, rather densely black pilose. The ninth tergum is cleft almost to its base, in the middle of the hind margin. The posterior lateral margins are rather broad and are not strongly produced at apices (fig. 5a). The ninth sternum is nearly two times wider than long, the posterior lateral margins are developed into two small lobes at their apices. The posterior median margin of the sternum has a membranous gibbosity which extends over the aedeagus. The claspers are very large and extend nearly to

the hind margin of the ninth tergum. The apical portion of each elasper is attenuated and terminates in a pair of small lobes (fig. 5b).

Length: Body, 7.0 mm.; wings, 7.5 mm.

Female.—Antennae eleven segmented, the apical segment is small and nipple-like. The front has a very strong black tubercle just above the antennae and a rather strong ridge extends to the ocellar tubercle. The wings are darker fumose than in the male.

Length: Body, 7.0 mm.; wings, 8.5 mm.

Holotype male and allotype female: Chanchamayo (Coll. Oldenbert). Dr. Hans Saetlehen has added the following information about the specimens and the type locality: "Chanchamayo is the source (Quellfluss) of the river Ucayali in Peru. The specimens were collected by Wilhelm Schnuse, probably between the 8th and 10th of January, 1904."

Both specimens have been returned to the Deutsches Entomologisches Institut, Berlin.

***Plecia quasimaculata*, n. sp.**

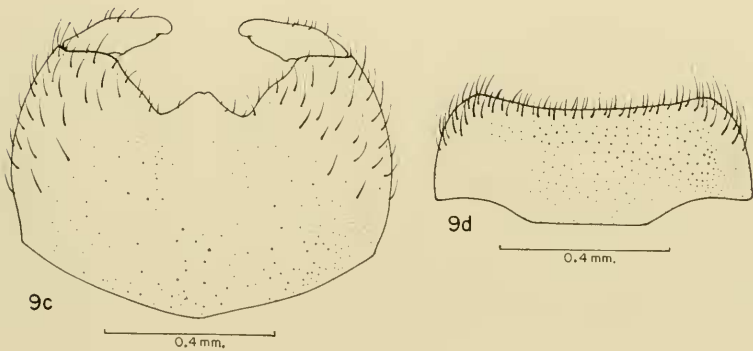
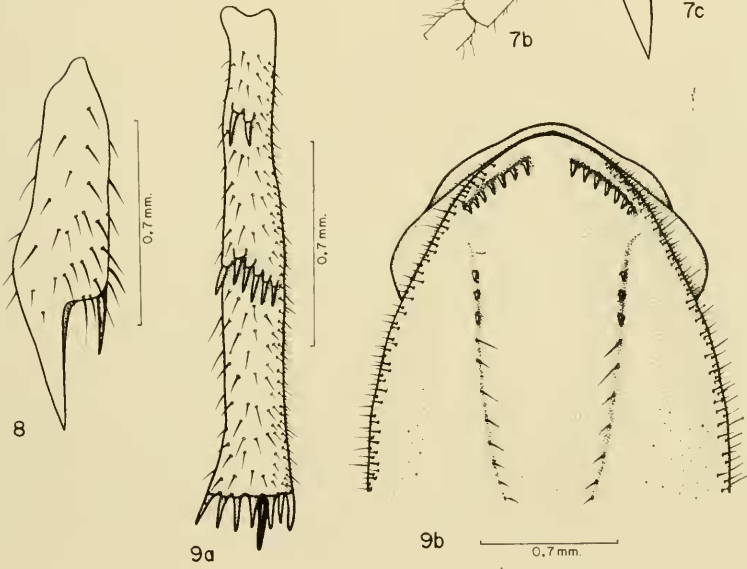
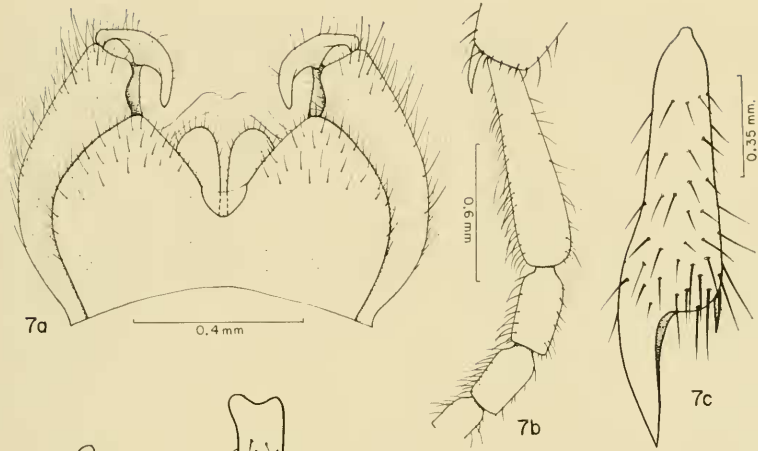
(Figs. 6a-e)

This species superficially resembles *P. maculata* Hardy (1942:110, figs. 151a-d) but the two are not closely related. The genitalia are very different as seen by comparing the above mentioned figures with figures 6a and 6b. On the basis of the male genital characters *quasimaculata* is probably more closely allied to *perplexa* Hardy (1942:112, figs. 159a-d) but the genitalia differ considerably as shown by comparison of the figures.

In my key to the new world *Plecia* (Hardy 1945:393) *quasimaculata* will run in the second part of couplet 39 to *lindneri* Edwards; *P. maculata* Hardy should also be keyed at this point and the couplet should be modified as follows: the second statement, "Pleura and anterior of notum black," should go to number 39a.

- 39a. Posteromedian margin of ninth tergum produced into a strongly sclerotized four-lobed process (fig. 6b). Posterior margin of ninth sternum scarcely extending beyond bases of elaspers (fig. 6c). (Haiti) ***quasimaculata*, n. sp.**
- Posteromedian margin of ninth tergum not produced. Posterior margin of ninth sternum extending nearly to apices of elaspers 39b
- 39b. Posterior median margin of ninth sternum strongly produced, lateral margins not lobate (Hardy 1945:531, fig. 149). Claspers bilobed (loc. cit., fig. 149b). Ninth tergum with a rather shallow V-shaped cleft (loc. cit., fig. 149c). (Boliyia, Western Brazil, and Peru) ***lindneri* Edwards**

Fig. 7, *Bibio illaudatus* n. sp. a. male genitalia, dorsal; b. hind tarsus of male; c. front tibia of male. Fig. 8, *B. obediens* Osten Saeken. Front tibia of male, specimen from the New Hebrides. Fig. 9, *Philia inconnexa* n. sp. a. front tibia; b. anterior portion of male thorax, dorsal; c. male genitalia, ventral; d. ninth tergum of male.



Posterior margin of ninth sternum not developed medianly, but with moderately developed submedian lobes and rather strong lateral lobes (Hardy, 1945:431, fig. 151a). Claspers simple, acute at apices (loc. cit., fig. 151b). Ninth tergum with a rather deep narrow cleft on hind margin (loc. cit., fig. 151d). (Trinidad)

..... maculata Hardy

Male.—*Head*: The ocellar triangle is prominent, raised above the eye margin a distance equal to about five rows of eye facets. The mouth parts are rather strongly produced, equal in length to the remainder of the head. The antennae are broken on the type, the two basal segments are black, tinged faintly with rufous. The last segment of the palpus is 2.5 times longer than wide; the penultimate segment is about as wide as long. *Thorax*: Entirely opaque, predominantly orange colored above, dark brown to black on the sides. The anteromedian portion of the mesonotum is black, the humeral ridges are black except for a rufous spot in the median portion. The scutellum has a black longitudinal vitta over the median portion. Submedian grooves are moderately developed on the mesonotum and a faint median groove is present at about the half-way point before the depression. The pleura are distinctly gray pollinose. The halteres are black, tinged with brown on the knobs. *Legs*: Entirely black, tinged with brown in the ground color, vestiture black. Hind basitarsus about equal in length to the next two tarsal segments, and about one-third as long as the tibiae. *Wings*: Brown fumose, darker along the anterior margin. The stigma is scarcely differentiated from the surrounding membrane. Vein R2+3 is oblique, nearly straight, and forming about a 65° angle with vein R4+5. The costa ends about one-third the distance between the apices of veins R4+5 and M1+2. The basal section of the radial sector is about equal in length to the section of vein M1+2 just beyond the r-m crossvein. *Abdomen*: Entirely black, rather densely gray pubescent, all pile black. The ninth sternum is about two times wider than long and the posterior margin has a pair of rather small submedian lobes. The claspers are rather large, and each is tapered to a sharp point at apex (fig. 6c); from lateral view the inner margin of the elasper is produced into a blunt prominence. The posterior lateral margins of the ninth tergum are moderately lobate (fig. 6a), the median margin is produced into a shelf-like portion which extends vertically into the genital chamber (fig. 6b).

Length: Body, 5.5 mm.; wings, 6—6.3 mm.

Female.—Except for the compound eyes the head is densely gray pubescent. The sclerotized portion of the head in front of the eyes, and the portion of the head behind the eyes, are both about one-third as long as the compound eyes. The compound eye is almost one-half longer than wide. The front is about equal in width to one of the compound eyes, is slightly carinate on the anterior portion and has a distinct pit-like depression in the middle. As seen in direct dorsal view the head is about as wide as long. The thorax is colored as in the male except that a black streak occurs down each side of the mesonotum; I believe much of this, however, might be due to discoloration and may not be typical. In other details fitting the description of the male except for sexual characters, vein R2+3 is more gently curved, however, and the abdomen is tinged with brown.

Length: Body, 6.5 mm.; wings, 7.75 mm.

Holotype male and allotype female from Kenshoff, Haiti, June 24, 1931 (Kisliuk and Cooley).

Type and allotype deposited in the United States National Museum.

Plecia similis Rondani

Plecia similis Rondani, 1850, Nuovi Ann. Delle Sci. Nat., ser. 3, 2:193.

This species was inadvertently left out of my key to the new world *Plecia* (Hardy 1945:391-395). It runs to couplet 21 (page 392) with *P. marginata* Edwards and *nitidipes* Edwards. The male genitalia of *marginata* have not been studied but that species should be readily differentiated by the continuous orange border around the mesonotum. Both *nitidipes* and *similis* have the body entirely dull black and the wings are evenly pale yellow fumose. Couplet 21 of this key should be modified as follows: The second part should read "Entirely black species" . . . 21a

- 21a. Face scarcely produced beyond the lower margins of the eyes. Ninth tergum developed into a sharp point on posteromedian margin (Hardy 1945: 533, fig. 156b). Ninth sternum with moderately developed submedian and lateral lobes on posterior margin. Claspers slender (loc. cit., fig. 156a). (Ecuador) *nitidipes* Edwards
- Rostrum very elongate, extending longer than the head and greater in length than the antennae. Ninth tergum of the male with an indistinctly bilobed development on posteromedian surface (loc. cit., fig. 176c). Ninth sternum without lateral lobes but the posteromedian portion is produced into a bilobed process which extends to the apices of the claspers. Claspers very broad and blunt (loc. cit., fig. 176a). (Brazil and Argentina) *similis* Rondani

P. similis is very closely related to *P. collaris* (Fabricius) in spite of the very different body coloration in the two species. The male genitalia show close affinities and appear to differ only in the development of the male clasping structures. In *similis* the claspers are very broad, about as wide as long and blunt at apices (loc. cit., figs. 176a and 176b). In *collaris* the claspers are more narrowed apically, and more distinctly bilobed (loc. cit., figs. 135c and 135e).

Plecia thulinigra, n. name

A new name for *Plecia nigra* Lundström, 1916, Ann. Mus. Nat. Hung. 14:457 (from Amur Land.), Preoccupied by *Plecia nigra* (Philippi), 1865, Verh. Zool.-bot. Ges. Wien 15:640 (from Chile).

Okada (1938:201) placed *nigra* Lundström as a synonym of "*Plecia rclutina* (Loew)." I do not believe this synonymy to be correct and feel that *nigra* Lundström is probably a distinct species. *P. rclutina* was described as a *Pcnthetria* and was correctly placed; I have studied the type in the Zoologisches Museum, Humboldt Universität, Berlin. *P. nigra* Lundström has never been clearly defined in the literature. The original was based upon a female specimen and the description would fit several species of dark bodied *Plecia* from the oriental region.

Duda's description (1930:10) of what he called the male of "*nigra* Lundstr." is also very general and gives no specific details which might actually differentiate the species. *P. nigra* Lundström is obviously similar in general details to *P. aterrima* Brunetti but cannot be correctly placed until a study is made of the male genitalia of specimens from near the type locality.

***Bibio illaudatus*, n. sp.**

(Figs. 7a-c)

This species is closely related to *B. obediens* Osten Sacken and may possibly be a subspecies of this. It differs from *obediens* in having the inner spurs of the front tibiae short and poorly developed and by having all femora black.

Male.—Entirely shining black species, except for the pale humeral ridges, reddish tibial spurs and yellowish bases of halteres. Pile all black, very dense and rather elongate. *Head*: Antennae ten segmented, the last three are very closely joined. Eyes densely pilose, ocellar tubercle prominent. *Legs*: Femora very faintly tinged with reddish in the ground color. The outer spur of each front tibia is about half as long as the remainder of the segment. The inner spur is short and not more than one-fourth as long as the outer (fig. 7c); the apical bristles on the tibiae are longer than the inner tibial spur (refer to figure 8 of *obediens* for comparison). The hind tibiae are thickened apically, about equal in width to the femora. The hind basitarsi are slightly swollen, about 3.5 times longer than wide. The other tarsal segments are also slightly swollen (fig. 7b). The apical spurs of the hind tibiae are sharp pointed. *Wings*: Dark brown to black fumose, the stigma is just slightly darker than the wing membrane. All veins are dark brown. The basal section of Rs is just slightly longer than the r-m crossvein. Vein M1+2 forks just before the m crossvein. The costa ends at the tip of Rs. *Abdomen*: Opaque black, densely haired on the sides and sparsely so in the middle of the dorsum. Ninth sternum 1.57 times wider than long, the cleft on the hind margin extends about one-third the length of the segment. Claspers slender, sharp pointed. Ninth tergum twice as wide as long, with a V-shaped cleft extending about two-thirds the length of the segment (fig. 7a).

Length: Body, 7.0—7.4 mm.; wings, 5.5—6.0 mm.

Female unknown.

Holotype male and five paratype males: Hienghene, New Caledonia, June 7, 1944 (W. Crabb).

Type and four paratypes returned to the United States National Museum. One paratype is in the University of Hawaii collection.

***Philia inconnexa*, n. sp.**

(Figs. 9a-d)

This species is apparently related to *P. occipitalis* (Edwards) because of the twelve-segmented antennae and the arrangement of the spines on the front tibiae. It differs by the following characteristics: the legs are entirely dark colored, not chiefly yellowish; the middle row of spines on the front tibia is situated at the middle of the seg-

ment, not beyond the middle, and the single spine is at the basal one-fourth of the tibia, not just before the middle, the anterior comb of the thorax on the females is well separated into two combs, the separation is equal in width to three or four of the teeth, not indistinctly divided; no longitudinal furrow is present between the combs; the area between combs in the female is dark reddish, slightly discolored with blackish, not yellowish; larger species, wing, 9.5 mm. in female of *inconnera* and 6.0 mm. in *occipitalis* (Edwards).

The males are characterized from other *Philia* by having but one transverse thoracic comb. They fit near *P. plaumanni* (Edwards) (male of *occipitalis* not known) but are readily recognized by the following characters: The twelve-segmented antennae, not ten; the presence of just one transverse comb on the thorax; by having six spines in the middle set on the front tibiae, not four; by having two spines in the top set at basal one-fourth of front tibia, not with one spine just before middle; the wings paler in color, not smoky black; and the larger size, wing length 7.5 mm., not 4.0 mm.

Male.—*Head*: Rostrum (sclerotized portion of face beyond the eyes) short, not developed beyond the bases of the antennae. Face and underside of head covered with rather long black hairs. Scape and pedicel of antenna yellow, the latter is about two times longer than the scape and bears a circle of short black bristles near the apex. Flagellum made up of ten very distinct segments, the apical one is two or more times longer than the subapical segments and may be composed of two fused segments. The base of the first flagellar segment is yellow, the remainder of the flagellum is black. The upper portion of each compound eye is reddish in color, the lower portion, composed of smaller facets, is dark brown to black. *Thorax*: Chiefly dark red in color, black on the anterior median portion of the mesonotum in front of the single transverse comb. The comb is located near the front portion of the mesonotum and is separated into two sets of six to seven spines each, these are separated on the middle of the mesonotum by a space equal to the distance between three of the spines in the comb (fig. 9b). Two longitudinal furrows extend three-fourths the length of the mesonotum, each furrow has two to three black spines arranged in a longitudinal row at about the anterior third of the mesonotum; a row of black hairs extends down each furrow. The margins of the mesonotum and the scutellum are rather thickly covered with moderately long black hairs. The scutellum is chiefly brown to black, the metanotum is rufous. Halteres rufous, with a brownish tinge. *Legs*: Coxae, trochanters, tibiae, and tarsi brown to black with a faint to moderate reddish tinge. Femora rufous, the middle and hind pairs are tinged with brown on their apical portions. The front tibiae each have three, rather evenly spaced, sets of spines. The first set has two spines and is located at the basal one-fourth of the tibia. The second set contains six spines, in a slightly oblique row, and is located just beyond the middle of the tibia. The apical set has eight to nine spines and a well-developed spur, the latter is about twice as large as the spines (fig. 9a). The hind femora are clavate, narrowed at bases and enlarged on apical halves. The hind tibiae are also moderately swollen at their apices. *Wings*: Faintly tinged with yellow, darker along the costal margin. The stigma is brown and contrasts rather sharply with the yellow wing margin. The anterior

veins are yellow, tinged slightly with brown, the posterior veins are concolorous with the membrane. The fork of veins M1 and M2 is opposite the m crossvein. The costa extends about three-sevenths the distance between the tips of veins Rs and M1. *Abdomen*: Entirely black, rather thickly black pilose. The ninth tergum is about four times wider than long and the hind margin is straight (fig. 9d). The ninth sternum is about one-fourth wider than long and has a gibbosity in the middle of the hind margin. The claspers are rather short and blunt (fig. 9e).

Length: Body and wings, 8.5 mm.

Female.—Somewhat darker in color than the male, with a distinct black tinge in the ground color. *Head*: Entirely black, the integument is rather roughly rugose, especially on the face and front. The face is more prolonged than in the male but extends just slightly beyond the antennae. The rostrum is slightly more than half as long as the compound eyes. The ocelli are situated on a distinct tubercle. The pedicel of the antenna is more brownish in color than in the males. *Thorax*: Dark red with a faint black tinge, especially around the margins of the mesonotum. Both the anterior and posterior combs are well developed on the mesonotum, these are both rather widely separated in the middle into two sets of spines and there is no furrow between the two combs. The furrows behind the posterior comb each possess three spines in a longitudinal row as in the male. *Wings*: Yellow-brown fumose, somewhat more broad than in the male. *Legs*: The femora are darker red, the hind two pairs are tinged with black. The front tibiae each have just a single spine above the middle set, this is located at the basal one-fourth of the segment. The hind tibiae are not so clavate as in the male.

Length: Body, 8.5 mm.; wings, 11.0 mm.

Holotype male: Northern Venezuela, April 21, 1943 (Rene Lichy). Allotype female, same data, in copula.

Both have been returned to the United States National Museum.

Philia quinquespinae, n. sp.

(Figs. 10a-d)

This species resembles *P. minima* Hardy, from Costa Rica. It differs from *minima* by having the rostrum produced well beyond the bases of the antennae; by having three spines in the middle set on front tibia, rather than four; by having the legs chiefly black, not rufous; and by having ten segments in the antennae, not eight.

Male.—A small conspicuously marked species, the body pile is rather sparse and entirely brown. *Head*: The rostrum is well developed, almost equal in length to the flagellum of the antenna. The antennae are dark brown to black, composed of ten segments. The rostrum and extended mouth parts are at least one-third longer than the compound eyes. *Thorax*: Predominantly yellow to rufous, the pronotum, the scutellum, and the metanotum are brown to black; the anterior median portion of the mesonotum, in front of and behind the comb, is dark brown on the type and just slightly discolored with brown on the paratype. Only one thoracic comb is present, this is slightly divided in the median portion and has five strong teeth on each side (fig. 10b). The mesonotum is sparsely black haired down the dorso-central lines and on the sides, the scutellum is

rather thickly black haired. The knobs of the halteres are brown, tinged with yellow; the stems are pale. *Legs*: The front coxae and trochanters are yellow to rufous, the legs are otherwise predominantly brown to black, tinged with rufous; the bases of the front and middle femora are yellow, tinged lightly with brown. The front tibia is slender and has three sets of spines; two spines are situated near the basal fourth and three are near the middle of the segment (fig. 10a). The apical spur is about equal in size to the apical spines. The hind legs are slender, the basitarsus is 5.5 times longer than wide. *Wings*: Predominantly

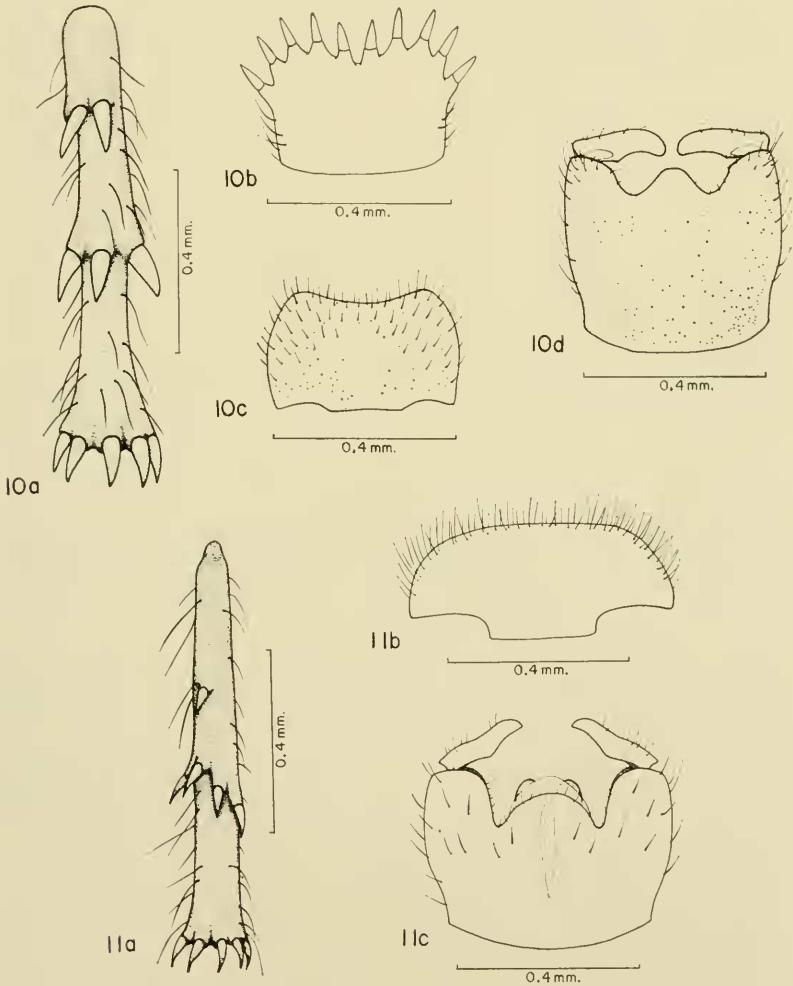


Fig. 10. *P. quinquespina* n. sp. a. front tibia; b. anterior thoracic comb; c. ninth tergum of male; d. male genitalia, ventral. Fig. 11. *P. segregata* n. sp. a. front tibia; b. ninth tergum of male; c. male genitalia, ventral.

hyaline, very faintly tinged with yellow, the anterior margin of the wing is yellow-brown, concolorous with the stigma. The costal margin extends about one-third the distance between the apices of the radial sector and vein M1. *Abdomen*: Dark brown to black, sparsely covered with black pile. The ninth tergum is about one-third wider than long and the hind margin is very gently concave (fig. 10c). The ninth sternum is gibbose in the posterior median portion and the claspers are short and blunt (fig. 10d).

Length: Body, 4.1 mm.; wings, 3.6 mm.

Female.—The head is long and narrow, from a direct dorsal view it is about 2.25 times longer than wide. The rostrum and the portion of the head behind the eyes are both about equal in length to the compound eyes. The extended mouth parts are about equal in length to the remainder of the head. The front is entirely flat, the portion between the eyes is about equal in width to one eye. The ocellar triangle is not strongly produced, it is about as high as one ocellus. The two basal segments of the antennae are yellow. Two well-developed combs are present on the dorsum of the thorax, the anterior comb is divided into two sets of three to four stout, blunt teeth; the posterior comb has nine or ten small teeth. The wings are more distinctly infuscated with yellow-brown. The abdomen is dark brown to black in ground color, densely covered with velvety brown pubescence.

Length: Body, 4.75 mm.; wings, 5.25 mm.

Holotype male from Cayamas, Cuba, "8.6" (E. A. Schwarz). Allotype female, Barceloneta, Puerto Rico, Dec. 8, 1932, on corn leaf (Anderson, Mills, and Faxon). Four paratypes: One male same data as allotype; two females, Saba, Dutch West Indies, Jan. 1937 (S. T. Danforth), and one female, Aibonito, Puerto Rico 11. 10. 1925, no collector given, accession number F5102.

Type and allotype returned to the United States National Museum, two paratypes returned to the American Museum of Natural History, and two paratypes retained in the University of Hawaii collection.

***Philia segregata*, n. sp.**

(Figs. 11a-c)

This species is related to *P. plaumanni* (Edwards) but is readily differentiated by having the thorax of both sexes entirely black, rather than rufous; by having three opaque, finely rugose longitudinal vittae down the mesonotum, rather than the mesonotum being entirely polished and smooth. Also the arrangement of the thoracic combs is different in the two species, and the claspers of *segregata* are pointed, rather than blunt.

Male.—Entirely dark colored, rather thickly black pilose species. *Head*: The antennae are twelve segmented, the last two segments are rather closely joined; the two basal segments are yellow, tinged with brown, the flagellum is brown. The head is not produced beyond the bases of the antennae. The palpi are rather short, the segments are scarcely longer than wide. The ocellar tubercle is strongly developed, about three or four times higher than one ocellus. *Thorax*: Polished black except for three finely rugose longitudinal vittae which extend down the mesonotum; the median vitta extends to the anterior margin of the

mesonotum. The mesonotal combs are each made up of about five small, sharp pointed teeth on each side, with just a narrow separation in the middle of the comb. The posterior comb has several tiny lateral teeth displaced backwards. The halteres are dark brown to black. *Legs*: Dark brown to black, tinged with rufous in the ground color and rather densely black pilose. Each front tibia has one spine on the posterodorsal surface near the basal third of the segment and four spines arranged obliquely near the middle (fig. 11a). The apical spur is nearly two times larger than the apical spines. The hind legs are slender, the tibiae and tarsi are straight sided. The hind tibiae are 2.25 times longer than the basitarsi and the basitarsi are about 7.5 times longer than wide. *Wings*: Faintly infuscated with yellow, yellow-brown along the anterior margin. Stigma and anterior veins dark brown; posterior veins, yellow-brown. The costa extends about three-fifths the distance between the apices of the radial sector and vein M1. *Abdomen*: Entirely black and covered with black pile. Ninth tergum, nearly three times wider than long (fig. 11b), the posterior margin is straight. The cerci are broad and blunt. The ninth sternum is gibbose on the posterior median margin and the claspers are pointed at the apices (fig. 11c).

Length: Body, 4.55 mm.; wings, 4.65 mm.

Female.—Similar in most respects to the male. The pleura are tinged brownish red in the ground color and the wings are more deeply infuscated with yellow-brown than in the male. The head is about one-half longer than wide and is slightly tapered toward the posterior margin. The portion of the head behind the eyes is slightly greater in length than the eyes. The head is not produced beyond the bases of the antennae. The basal two segments of the antennae are yellow, tinged lightly with brown. The abdomen is velvety brown. The middle set of spines on the front tibia sometimes contain five spines.

Length: Body, 4.7-5.5 mm.; wings, 6-6.75 mm.

Holotype male and allotype female, Nova Teutonia, Brazil, 27° 11' B. 52° 23' L., 23-24 Nov. 1940 (Fritz Plaumann). Thirteen paratypes, six males and seven females, same locality and collector as type taken on several dates in September, October and November, 1939 and 1940.

Type, allotype and two paratypes being deposited in the United States National Museum. The remainder of the paratypes are being distributed among the following collections: British Museum (Natural History), Bernice P. Bishop Museum, and the University of Hawaii.

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